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# TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number

RECEIVED  
09/920,607

Filing Date

DEC 07 2001  
July 31, 2001

First Named Inventor

TECH CENTER 1600/2900  
Jeremy Minshull

Group Art Unit

1642

Examiner Name

Unassigned

Total Number of Pages in This Submission

Attorney Docket Number

02-106410US

### ENCLOSURES (check all that apply)

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Fee Transmittal Form                                | <input type="checkbox"/> Assignment Papers (for an Application)  | <input type="checkbox"/> After Allowance Communication to Group                            |
| <input type="checkbox"/> Fee Attached  | <input type="checkbox"/> Drawing(s)  | <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences        |
| <input type="checkbox"/> Amendment / Response                                | <input type="checkbox"/> Licensing-related Papers  | <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) |
| <input type="checkbox"/> After Final   | <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition   | <input type="checkbox"/> Proprietary Information   |
| <input type="checkbox"/> Affidavits/declaration(s)                           | <input type="checkbox"/> Petition to Convert to a Provisional Application  | <input type="checkbox"/> Status Letter   |
| <input type="checkbox"/> Extension of Time Request                           | <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address  | <input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below):       |
| <input type="checkbox"/> Express Abandonment Request                         | <input type="checkbox"/> Terminal Disclaimer   | receipt acknowledgment postcard  |
| <input checked="" type="checkbox"/> Information Disclosure Statement         | <input type="checkbox"/> Small Entity Statement  | 1449   |
| <input type="checkbox"/> Certified Copy of Priority Document(s)              | <input type="checkbox"/> Request for Refund  | Cited References   |
| <input type="checkbox"/> Response to Missing Parts/ Incomplete Application   | <b>Authorization to Charge Deposit Account</b><br>Please charge Deposit Account No. 50-0893 for any additional fees associated with this paper or during the pendency of this application, including any extensions of time for consideration of the documents enclosed. |  |
| <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53 | Remarks  |  |

### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name

Jonathan Alan Quine Reg. No. 41261, The Law Offices of Jonathan Alan Quine

Signature

*Jonathan Alan Quine*

Date

11-7-01

### CERTIFICATE OF MAILING

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Amelia Groth

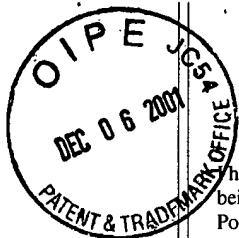
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*Amelia Groth*

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The Law Offices of Jonathan Alan Quine

By [Signature]  
Amelia Groth

Attorney Docket No. 02-106410US  
Client Ref. No. 0178.210US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Jeremy Minshull, *et al.*

Application No.: 09/920,607

Filed: July 31, 2001

For: BIOSENSORS, REAGENTS AND  
DIAGNOSTIC APPLICATIONS OF  
DIRECTED EVOLUTION

Examiner: Unassigned

Art Unit: 1642

INFORMATION DISCLOSURE  
STATEMENT UNDER 37 CFR § 1.97 and  
§ 1.98

Assistant Commissioner for Patents  
Washington, D.C. 20231

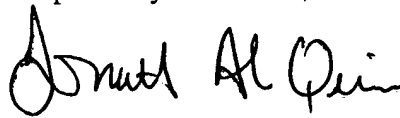
Sir:

The references cited on attached form PTO-1449 are being called to the attention of the Examiner. Copies of the references are enclosed. It is respectfully requested that the cited information be expressly considered during the prosecution of this application, and the references be made of record therein and appear among the "references cited" on any patent to issue therefrom.

As provided for by 37 CFR 1.97(g) and (h), no inference should be made that the information and references cited are prior art merely because they are in this statement and no representation is being made that a search has been conducted or that this statement encompasses all the possible relevant information.

Applicant believes that no fee is required for submission of this statement, since it is being submitted prior to the first Office Action. However, if a fee is required, the Commissioner is authorized to deduct such fee from the undersigned's Deposit Account No. 50-0893. Please deduct any additional fees from, or credit any overpayment to, the above-noted Deposit Account.

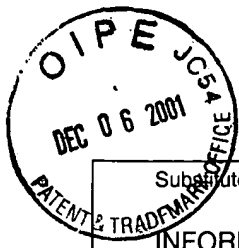
Respectfully submitted,



Jonathan Alan Quine  
Reg. No. 41,261

THE LAW OFFICES OF JONATHAN ALAN QUINE  
P.O. Box 458  
Alameda, CA 94501  
Tel: (510) 337-7871  
Fax: (510) 337-7877

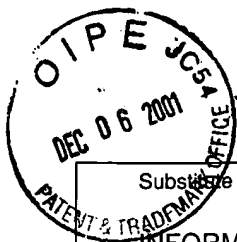
JAQ:ag



Substitute for form 1449A-B/PTO <b>INFORMATION DISCLOSURE          STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>	Complete if Known	
	Application Number	<b>09/920,607</b>
	Filing Date	<b>July 31, 2001</b>
	First Named Inventor	<b>Jeremy Minshull</b>
	Group Art Unit	<b>Unassign d</b>
	Examiner Name	<b>Unassigned</b>
	Attorney Docket Number	<b>02-106410US</b>

U.S. PATENT DOCUMENTS						
Examiner Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, lines, Where Relevant Passages or Relevant Figures Appeal
		Number	Kind Code (if known)			
	AA	5,512,463		Stemmer	04-30-1996	
	AB	5,514,588		Varadaraj	05-07-1996	
	AC	5,605,793		Stemmer	02-25-1997	
	AD	5,763,239		Short et al.	06-09-1998	
	AE	5,789,228		Lam et al.	08-04-1998	
	AF	5,811,238		Stemmer et al.	09-22-1998	
	AG	5,814,473		Warren et al.	09-29-1998	
	AH	5,824,469		Horwitz et al.	10-20-1998	
	AI	5,830,696		Short	11-03-1998	
	AJ	5,830,721		Stemmer et al.	11-03-1998	
	AK	5,834,252		Stemmer et al.	11-10-1998	
	AL	5,837,458		Minushull et al.	11-17-1998	
	AM	5,866,363		Pieczenik	02-02-1999	
	AN	5,876,997		Kretz	03-02-1999	
	AO	5,925,749		Mathur, et al.	07-20-1999	
	AP	5,928,905		Stemmer, et al.	07-27-1999	
	AQ	5,939,250		Short, Jay M.	08-17-1999	
	AR	5,939,300		Robertson, et al.	08-17-1999	
	AS	5,942,430		Robertson, et al.	08-24-1999	
	AT	5,948,666		Callen, et al.	09-07-1999	
	AU	5,958,672		Short, Jay M.	09-28-1999	
	AV	5,958,751		Murphy, et al.	09-28-1999	
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	AY	5,965,408		Short, Jay M.	10-12-1999	
	AZ	5,985,646		Murphy, et al.	11-16-1999	
	BA	6,001,574		Short et al.	12-14-1999	
Examiner Signature					Date Considered	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



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	Group Art Unit	<b>Unassign d</b>
	Examiner Name	<b>Unassigned</b>
Attorney Docket Number	<b>02-106410US</b>	

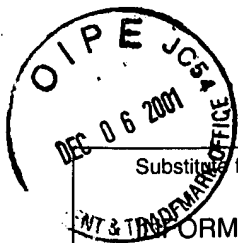
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	BF	6,096,548		Stemmer	08-01-2000	
	BG	6,117,679		Stemmer	09-12-2000	
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	BJ	6,168,919		Short	01-02-2001	
	BK	6,171,820		Short	01-09-2001	
	BL	6,174,673		Short, et al.	01-16-2001	
	BM	6,180,406		Stemmer	01-30-2001	
	BN	6,238,884		Short et al.	05-29-2001	

**FOREIGN PATENT DOCUMENTS**

Examiner Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Office	Number	Kind Code (if known)				
	BO	WO	97/07205		Novo Nordisk A/S	02-27-1997		
	BP	WO	97/20078		Affymax Technologies	06-05-1997		
	BQ	WO	97/25410		Novo Nordisk A/S	07-17-1997		
	BR	WO	97/35957		Maxygen, Inc.	10-02-1997		
	BS	WO	97/35966		Maxygen, Inc.	10-02-1997		
	BT	WO	97/44361		Recombinant Biocatalysis Inc.	11-27-1997		
	BU	WO	97/48416		Recombinant Biocatalysis, Inc.	12-24-1997		
	BV	WO	97/48717		Recombinant Biocatalysis Inc	12-24-1997		
	BW	WO	97/48794		Recombinant Biocatalysis Inc	12-24-1997		
	BX	WO	98/00526		Recombinant	01-08-1998		

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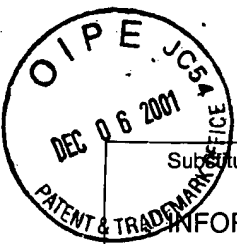


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	Group Art Unit <b>Unassigned</b>
	Examiner Name <b>Unassigned</b>
	Attorney Docket Number <b>02-106410US</b>

	BY	WO	#	Name	Date		
				Biocatalysis Inc			
				Recombinant Biocatalysis Inc	01-15-1998		
				Maxygen, Inc.	04-02-1998		
				Maxygen, Inc.	04-02-1998		
				Diversa Corp.	06-11-1998		
				Maxygen, Inc.	06-25-1998		
				Novo Nordisk A/S	07-02-1998		
				Maxygen, Inc.	07-23-1998		
				The Dow Chemical Company	08-20-1998		
				Novo Nordisk A/S	09-24-1998		
				Novo Nordisk A/S	09-24-1998		
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				California Institute of Technology	10-01-1998		
				Diversa Corp.	10-29-1998		
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				Diversa Corp.	03-04-1999		
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				Diversa Corp.	04-22-1999		
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				Maxygen, Inc.	05-06-1999		
				Maxygen, Inc.	05-06-1999		
				Maxygen, Inc.	05-14-1999		
				Diversa Corp.	05-14-1999		
				California Institute of Technology et al.	06-17-1999		

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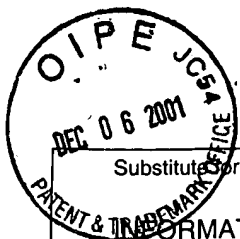
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	DA	WO	99/41383		Maxygen, Inc.	08-19-1999		
	DB	WO	99/41402		Maxygen, Inc.	08-19-1999		
	DC	WO	99/45154		Diversa Corp.	09-10-1999		
	DD	WO	99/57128		Maxygen, Inc.	11-11-1999		
	DE	WO	99/65927		Maxygen, Inc.	12-23-1999		
	DF	WO	00/42560		Maxygen, Inc.	07-20-2000		
	DG	WO	00/42561		Maxygen, Inc.	07-20-2000		
	DH	WO	00/53744		Diversa Corporation	09-14-2000		
	DI	WO	00/58517		Diversa Corporation	10-05-2000		

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T
	DJ	Chang, C., et al. (1999) "Evolution of a cytokine using DNA family shuffling." <i>Nature Biotechnology</i> 17:793-797.	
	DK	Christians, F.C. et al., (1999) "Directed evolution of thymidine kinase for AZT phosphorylation using DNA family shuffling." <i>Nature Biotechnology</i> 17:259-264.	
	DL	Coco et al., (2001) "DNA shuffling method for generating highly recombined genes and evolved enzymes" <i>Nature Biotechnology</i> vol. 19 pp. 354-359	
	DM	Crameri et al., (1993) "10(20)-Fold aptamer library amplification without gel purification," <i>Nuc. Acids Res.</i> 21(18):4410.	
	DN	Crameri, A. & Stemmer W.P.C. (1995) "Combinatorial multiple cassette mutagenesis creates all the permutations of mutant and wildtype cassettes." <i>Biotechniques</i> 18:194-195.	
	DO	Crameri, A. et al. (1996) "Improved green fluorescent protein by molecular evolution using DNA shuffling." <i>Nature Biotechnology</i> 14:315-319.	
	DP	Crameri, A. et al. (1996) "Construction and evolution of antibody-phage libraries by DNA shuffling." <i>Nature Medicine</i> 2:100-103.	
	DQ	Crameri, A. et al., (1997) "Molecular evolution of an arsenate detoxification pathway by DNA shuffling." <i>Nature Biotechnology</i> 15:436-438	

Examiner Signature		Date Considered	
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DR	Cramer, A. et al., (1998) "DNA shuffling of a family of genes from diverse species accelerates directed evolution." <i>Nature</i> 391:288-291.
DS	Gates, C.M. et al., (1996) "Affinity selective isolation of ligands from peptide libraries through display on a lac repressor 'headpiece dimer'." <i>Journal of Molecular Biology</i> 255:373-386.
DT	Minshull, J., Stemmer, W.P.C. (1999) "Protein evolution by molecular breeding." <i>Current Opinion in Chemical Biology</i> 3:284-290.
DU	Ness, J. et al., (1999) "DNA shuffling of subgenomic sequences of subtilisin." <i>Nature Biotechnology</i> 17:893-896.
DV	Patten, P.A. et al., (1997) "Application of DNA Shuffling to Pharmaceuticals and Vaccines." <i>Current Opinion in Biotechnology</i> 8:724-733.
DW	Pelletier, Joelle N., (2001) "A Ratchet for our toolbox" <i>Nature Biotechnology</i> vol. 19, p. 314-315
DX	Stemmer, W.P.C. (1994) "DNA Shuffling by random fragmentation and reassembly: In vitro recombination for molecular evolution." <i>PNAS</i> 91:10751
DY	Stemmer, W.P.C. (1994) "Rapid evolution of a protein in vitro by DNA shuffling." <i>Nature</i> 370:389-391.
DZ	Stemmer, W.P.C. (1995) "The Evolution of Molecular Computation." <i>Science</i> 270:1510
EA	Stemmer, W.P.C. (1995) "Searching Sequence Space." <i>Bio/Technology</i> 13:549-553.
EB	Stemmer, W.P.C. (1996) "Sexual PCR and Assembly PCR." In: <i>The Encyclopedia of Molecular Biology</i> . VCH Publishers, New York. pp. 447-457.
EC	Stemmer, W.P.C. & Soong, N.W. (1999) "Molecular breeding of viruses for targeting and other clinical properties." <i>Tumor Targeting</i> 4:59-62.
ED	Zhang, J. et al., (1997) "Directed evolution of an effective fucosidase from a galactosidase by DNA shuffling and screening." <i>Proceedings of the National Academy of Sciences, USA</i> 94:4504-4509.

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